MINERAL COMPOSITION OF THE PELITIC FRACTION OF THE DNISTER RIVER BOTTOM SEDIMENTS (UKRAINE): DATA OF SEMI-QUANTITATIVE ANALYSIS

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Investigation of the mineralogy of the pelitic component of the riverbed sediments is an integral part of the environmental–geochemical studies of the hydroecosystem as a whole, as fine-dispersed muds possess increased sorption ability (in comparison with sands), and can accumulate plenty of mineral salts and heavy metals. The sorption capacity of the pelitic fraction increases in the presence of sheet silicates (e.g. kaolinite and montmorillonite).

The quantitative phase identification was carried out with the methodology developed in the Karpynskyi`s Geological Research Institute, which is based on the dependence of the intensity of diffraction peaks of a crystalline phase on its relative quantity in a powdered sample (PONOMARIOV *et al.*, 1980).

The diffractograms were recorded on an ADP-2 automated powder diffractometer with cobalt radiation and iron filter (40 kV, 10–15 mA).

Oriented samples from the fraction ~0,005 mm were prepared. The mineral composition, with the identification of different varieties of illites and chlorites, was studied in detail.

It was proved by semi-quantitative of analysis that hydromica (illite) (reflections 10 Å, 4.9–5.0 Å, 3.32–3.34 Å, 2.5 Å), montmorillonite-chlorite (14.2–15.5 Å), kaolinite (7.0–7.1 Å, 3.52–3.57 Å, 2.38 Å), chlorite (13.8–14.0 Å, 7.0–7.1 Å, 4.7 Å, 3.52 Å, 2.87–2.89 Å) and illite-montmorillonite (rectorite) (11.0–11.2 Å) are the basic sedimentary clay minerals of the Dnister river bottom sediments (KOSHIL', 2000). Quartz, calcite, feldspar and gypsum are among the non-clay minerals.

Average clay mineral contents are the following: hydromica 27%, montmorillonite-chlorite 15%, kaolinite 4%, and chlorite 3%. On the basis of the observed data the allocation of clay minerals was carried out on the Dnister catchment area. Hydromica, chlorite, montmorillonite and montmorillonite-chlorite content increases from upstream to downstream Dnister. In this direction some "refining" clay component from terrigenous impurities (feldspars, quartz, gypsum) is noted. It is interesting to note that kaolinite content is practically the same on the entire investigated territory. Calcite content sharply increases from west to east.

The results have demonstrated the expediency of applying semi-quantitative X-ray phase analysis for a more detailed analysis of the mineral composition of the pelitic fraction and established laws of allocation of basic sedimentary minerals.

References

KOSHIL', M. (2000). Miner. Zbirnyk, 50/2: 106–109.

PONOMARIOV, V. *et al.* (1980). Methodic recommendation on quantitative analyses of the mineral content of the clay rocks by using X-ray diffractometry. Moscow: VSEGINGEO, (in Russian), 38.